FENCED ANIMAL MANAGEMENT PLAN

NEAL SMITH
NATIONAL WILDLIFE REFUGE
PRAIRIE CITY, IOWA

2002

Fenced Animal Management Plan **January 2002**
Neal Smith NWR

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INTRODUCTION

Neal Smith National Wildlife Refuge (NWR) was established first as Walnut Creek NWR (Refuge) on May 25, 1990 under the establishing authorities of The Recreation Act of 1962 (16 U.S.C. 460k) and The National Wildlife Refuge System Administration Act of 1966 (16 U.S. C. 668 dd-ee). The name of the Refuge was changed in 1997 in honor of Congressman Neal Smith who championed the establishment of the Refuge as well as the funding to build the Prairie Learning Center.

Legislation began in May of 1990 (Congressional Record H2727 and Public Law 101-305) to establish a refuge for the restoration/reconstruction of native tallgrass prairie and associated wetland and woodland habitats for breeding migratory waterfowl and resident wildlife. A Master Plan was initiated for the Refuge in 1990 and based on the evaluation of impacts in the concurrent Environmental Impact Statement (EIS), it was decided that the described habitats should be re-established with the re-introduction of a maximum of 100 bison and 150 elk. The final EIS mandated the re-introduction of bison and elk on the Refuge because it recognized their importance to achieve "bio-diversity, environmental education, interpretation, and recreation goals established for the Refuge".

Refuge Herd Management Goals

The Refuge is managed to restore the landscape and its wildlife as nearly as possible to the condition that existed prior to Euro-American settlement. The facility serves as a major Environmental Education Center, interpreting the relationship of people to their natural environment. The Refuge also provides appropriate recreational opportunities related to these ecosystems. In addition, the Refuge serves as a living laboratory for students and academics seeking to study the ecology of a recovering prairie and savanna landscape.

The intent of incorporating bison and elk into units of the National Wildlife Refuge System is to perpetuate bison species through habitat management. The *unique* aspect of Neal Smith NWR is that careful management of the herds will contribute to the perpetuation of **habitat** by recreating the role of large grazers in the historic tallgrass prairie/oak savanna ecosystem. Herd management goals that approximate near to, or at, a maximum capacity do not fit the primary goals or objectives of Neal Smith NWR. The specific herd management goals are:

- Grazing by large mammals is a major factor in the tallgrass prairie/oak savanna ecosystem. Bison and elk provide a major opportunity to manage and manipulate the effects of grazing in a reconstructed prairie landscape.

- The opportunity to study the interaction between the large grazers and the reconstruction/restoration process will serve as a focus of research at the Refuge. While some information exists concerning the relationship between grazing and existing prairie,

little is yet documented regarding the role of large native animals grazing in re-constructed prairie.

- To use bison and elk as instruments to introduce people to, and raise their awareness of, the importance of the tallgrass prairie ecosystem through direct experiences including environmental education, volunteer opportunities, interpretation and recreation.

Herd Histories

BISON

The first 8 bison arrived from Fort Niobrara in September 1996. This group ranged in age from yearling to 3 years old. In November 1996, we received an additional 6 yearlings from Wichita Mountain. In 1997, the first calf was born on the refuge increasing the herd to 15 head. More animals were transferred to the refuge in 1997 from Fort Niobrara ranging in age from 3 to 5 years and from the National Bison Range in the 1 to 2 year classes. By the end of 1997 the herd had reached 28 head. Final additions to the herd were made in 1998 with Fort Niobrara sending 3 yearling bulls. Nine calves were born on Neal Smith in 1998. During this time, 2 bulls died, one from a broken leg and the other from unknown causes (its carcass was found after a burn). One cow died while calving. By the end of 2000, an additional 16 calves had been born and survived to be counted in the fall round up for a total herd count of 53. An additional 15 calves were born during the spring of 2001 bringing the count to 68.

ORIGIN	YEAR	COWS	BULLS	CALVES
Fort Niobrara	1996	4	4	0
Wichita Mountain	1996	3	3	0
Neal Smith	1997	0	0	1
Fort Niobrara	1997	4	1	0
National Bison Range	1997	4	4	0
Fort Niobrara	1998	0	3	0
Neal Smith	98-00	0	0	25
		15	15	

ELK

Four bull elk were brought to the Refuge from Fort Niobrara in February 1998. Six elk were brought from the National Bison Range in 1999 which included 5 females, one adult and 4 yearlings, and one yearling bull. An undetermined number of calves was born to the elk in 2000

but the highest herd counts obtained were 14. Two bulls and a single cow died. The herd count in the spring of 2001 totaled 11. A single calf was spotted in 2001 bringing the number back up to 12. By January 2002, the herd count was again 14.

All bison and elk brought to the Refuge were certified to be tuberculosis and brucellosis free.

HERD MANAGEMENT

Herd management on Neal Smith NWR is conducted in close cooperation and communication between the Project Leader, Refuge Operations Specialist and Biologist. The Operations staff handles all logistics of maintaining the handling facility and fences, organization of round ups, and disposal of excess animals through donations and auctions. The Biologist determines age and sex structure of the herd, selects the animals to be placed on excess, handles all vaccinations, biological data collection and illness and diseases. The Refuge Biologist has prepared an appendix to this plan that details herd genetics, and disease prevention and control (Appendix A).

Herd Objectives

Population Size

The original objective for herd size was as many as 100 bison and 150 elk. An appropriate ecological carrying capacity for the 750 acre Refuge enclosure is no more than 35 bison animal units (AU) and 15 elk AU (15 acres per AU). This number of animals will ensure survival for the enclosed animals even during periods of drought or severe winter conditions without over-grazing the prairie. It will also allow periodic viewing opportunity for the public without producing a "zoo" effect. The following calculations and estimates of consumption are derived from Range Management: Principles and Practices.

The initial carrying capacity for 2001 was derived from the following information taken from the roundup in 2000:

- The average weights of 15 adult elk for a total of 10,500 pounds.
- The weights of 32 bison captured during the fall of 2000 were added for a total of 29,577 lbs. that equals an average of 925 lbs/animal.
- The weights of 16 bison not captured were estimated from the average weight of the 32 for a total of 14,800 lbs.
- The weights of 5 bulls not captured were estimated to be 1,350 pounds each.

Bison consume approximately 2% of their body weight per day in forage. To estimate consumption of bison the average weight of a cow (925 lbs) and the average weight of a bull (1,350 lbs) were added and then divided by two to get an average Animal Unit (AU) at a sex ratio of 1:1. Each bison AU will consume 22.75 pounds of forage per day or 8,304 pounds annually. Calves were not factored in to allow for error.

Elk also consume approximately 2% of their body weight per day. Each adult elk in our herd was estimated to weigh 700 pounds. The Refuge would like to maintain an adult elk herd no larger than 15 animals. Each elk will consume 14 pounds of forage per day or 5,110 pounds annually.

A conservative estimate of tall grass prairie forage production is 1,500 to 2,000 pounds per acre (J.L. Holechek et. al. 1989). A conservative estimate was used at the writing of this plan because actual forage production data for the Refuge enclosure was not available. There was also little information regarding the selection of forage by bison within the tall grass prairie region. The 750 acre enclosure should produce 1,125,000 to 1,500,000 pounds of forage annually.

Under the continuous grazing regime dictated by the single enclosure, a moderate grazing rate of 35% was selected to allow for drought conditions, poor grazing response, research manipulations or other dynamic conditions. In addition, a correction factor of 30% was added for soil/slope conditions on the area (average slope = 18%). After subtracting the forage needed for elk, the total *available* forage for bison is 198,975 to 290,850 pounds annually. No corrections were calculated for distance from water since it is always available within less than one mile.

The average weight of a bison AU was determined by adding the weights of an adult cow and a bull and halving it. The bulls in the Refuge herd are relatively young and will gain in weight as they mature. These figures will be adjusted accordingly using future round up weight data.

925 (cow) + 1350 (bull) = 2,275/2 = 1,137.5 pounds/AU

The average amount of forage consumed by a single AU per day is calculated by multiplying the weight of a single AU by 2%. Multiply this number by 365 to find the total consumption for a year.

1,137.5 X .02 = 22.75 pounds of forage per day per AU
22.75 X 365 = 8,304 pounds of forage/AUY (Animal Unit Year)

Divide the amount of available forage by the pounds of forage consumed by an AUY to determine the carrying capacity.
198,975/8,304 to 290,850/8,304 = 24 to 35 bison AUY

Future carrying capacities will be determined using 1,000 pounds as the AU, allowing 0.5 AUs for calves, 1 AU for cows and 2 AUs for bulls. This will allow for the additional weight put on by maturing of bulls. Elk will be allowed 0.7 AUs.

Herd Sex and Age Composition

BISON

Objectives of the bison herd are to maintain a 1:1 sex ratio and to vary the age structure of the herd in as close an approximation to a free ranging herd as possible. Excess animals will be generated from all age classes throughout the herd to maintain the integrity of the age structure, with an emphasis on calves and yearlings to maintain a small herd without decreasing the older animals.

ELK

The sex ratio of free-roaming, non-hunted elk herds is approximately 2:3 (personal communication, Bruce Smith, Biologist, National Elk Refuge). However, the Refuge will manage this herd at a 3:2 sex ratio or greater, favoring bulls. A herd consisting entirely of bulls would not be discouraged to reduce management issues. The Refuge will maintain no more than 15 head due to the difficulty of retaining the animals within an enclosure. When the herd exceeds 15, animals will be selectively removed based on the sex ratio and phenology. Methods of removing elk are yet to be determined. Options include special hunt tags or drugging and removal.

Herd Genetics

Bison genetics is currently at a diverse level within the herd and will be closely monitored in order to prevent the genes of a single bull from becoming dominant. Some experimentation may occur under the direction of Texas A & M genetics laboratory. Genetics will not be a consideration within the elk herd.

Grazing Management

Enclosures

Bison currently occupy an enclosure approximately 750 acres in size located in the west central portion of the Refuge. At the time of complete acquisition, approximately 2,000 acres will be under fence and divided roughly into 3 equal sub units with a central hub used as the health handling facility. Animals will be moved between sub units on a yearly or seasonal basis depending on the management activity of each sub unit. A comprehensive grazing plan will be initiated when additional units are available.

Perimeter fencing consists of 8 foot high tensile strength woven wire attached to 8 inch diameter treated wood posts driven into the ground. The posts are 12 foot lengths buried at a depth of 4 feet. Gates are located on each of four sides. Sixteen foot wide cattle guards are placed in the road traversing the bison area.

Information on the interactions of bison and reconstructed prairie habitat is limited or lacking. It is possible that bison could impact a small diverse prairie remnant. Research will be conducted

to monitor bison/prairie interactions.

Although an additional 1,250 acres will be added to the bison enclosure, a herd size no larger than what can be supported within the original 750 acre enclosure is strongly advised. Since the Refuge has a primary purpose of re-constructing prairie, not bison herds, the number of bison should be limited to this amount to maintain a proportional herd. The great number of bison that once roamed the grasslands of middle America were small in relation to the area.

Surplus Animal Disposal

Annual Roundup

Round ups will be conducted *every* year in accordance with 701 FW 8.11.C. to collect biological data, remove excess animals or to give the staff experience with handling the herd. Two methods of capture will be used for roundups. When it is only necessary to reduce the size of the herd and not to collect specialized biological data on the entire herd, baiting will be used. During the first week of October initial efforts will begin by baiting with salt/mineral blocks and tall grass prairie hay or brome grass. Baiting can continue until enough animals of the appropriate age and sex classes have been captured and removed from the herd. When a complete round up is necessary to remove animals and collect specialized biological data, a traditional roundup will be conducted after the third week of October with help from Fort Niobrara NWR, National Bison Range NWR or Wichita Mountain NWR. A drive fence line will be maintained on the east side of the facility to enhance this effort.

In either type of roundup, the Refuge biologist will perform genetic blood typing on yearlings and other animals that have not been typed previously. A microchip implant will be inserted in the ear of the animals that will be retained in the Refuge herd that do not already have one. Each microchip implant number will be recorded to identify age, sex, vaccination, and genetic information specific to the individual bison being tagged. When veterinary assistance is available, animals will be tested for general bovine diseases. All testing and vaccinations required for transporting bison within and across state lines will be the responsibility of the buyer or donee. When possible, a licensed veterinarian will be available on site for blood testing and vaccinations.

Sealed Bid Sale/Public Auction

Prior to the round up, the Refuge Biologist will determine the animals that will be retained in the Refuge herd according to genetic distribution. A list of excess animals will be given to the Operations Specialist and from that list donations will be selected. Approximately 25% of the excess animals will be donated to native American tribes in accordance with 701 FW 8.11.B (in support of Public Law 95-341, American Indian Religious Freedom Act, the Indian Self-Determination and Education Assistance Act, the Native American Policy of the U.S. Fish & Wildlife Service). Additional animals may be donated at the discretion of the Regional Director.

These efforts will be coordinated through the Inter-Tribal Bison Cooperative or individual tribes who express an interest in acquiring bison. Additional animals may be donated to educational or environmental programs such as Conservation Districts or State Parks. Bison will be selected for these donations based on a representation of the age class structure of excess animals and a 1:1 sex ratio. During the round up, donated bison will be identified and removed to an enclosed area where they can be picked up within 3 days after the round up. Sold or donated bison that are not picked up after 3 working days will be sold. Bison will not be donated or sold in less than lots of 2.

A final list of the age and sex of the remaining animals will be compiled and sent out in public announcement mailings and news releases. The Iowa and American Bison Associations and the National Buffalo Association will also be notified. These animals will be sold at public auction or by sealed bids. If the number of animals to be sold is less than 10, arrangements can be made with a local livestock handling facility such as the Colfax Livestock Yard and a public auction can be conducted. If the animals number more than 10, a sealed bid process will be used and animals sold in pairs. The successful and non-successful bidders will be notified by mail with successful bidders given a certain time to send payment. Successful bidders will be notified when they are scheduled to load out, usually the day after the round up. A list of interested parties will be compiled from the public announcement mailing responses sent to native American tribes, conservation districts, parks and the general public. In the event that donated or sold bison are not picked up, parties on this list will be notified of additional animals for sale and given a date to attend an open bidding. Unclaimed animals will be sold and loaded out on the same day of the sale.

The bidding process and sale of animals will be coordinated by the Project Leader and the Refuge Operations Specialist. Bidding and sales information will primarily be tracked and recorded by the Refuge Administrative Assistant. Approximately 3-4 staff at 2-3 hours each will be required to process sealed bids.

Disease Prevention and Control

Any animal that is dying or dead in the opinion of the Refuge Biologist, Operations Specialist or Project Leader will be dispatched effectively and humanely. Such animals will be removed from public view and will be allowed to decompose naturally in the field.

In order to remain informed and in compliance with all state and federal health laws and regulations, the Iowa Department of Agriculture and U.S. Department of Agriculture will be consulted regularly. Open lines of communication will be maintained with the Iowa State University of Veterinary Science as well as local and state veterinarians.

Iowa is a brucellosis Class A state where the chances of contracting brucellosis or tuberculosis is

very low. Vaccination is not required by the state. Service policy prohibits the vaccination of bison herds. The Refuge herd will be monitored for condition and their general health checked each year during the roundup by a veterinarian.

MANAGEMENT OF PUBLIC VIEWING

Auto Tour

Environmental Education and Interpretation are primary goals at Neal Smith NWR and Prairie Learning Center. Bison are an indispensable tool used to introduce the public to concepts involving ecosystem management and the work of the Service. Environmental education and interpretation activities use the proximity of bison to focus public attention on the reconstructed tallgrass prairie ecosystem and Service roles in the process.

Viewing opportunities are provided to the public on the auto tour, from the large, north-facing windows in the Prairie Learning Center and from the Overlook and Two-Mile trails adjacent to the Learning Center. Special events and tours are also conducted to provide additional viewing and educational opportunities to Refuge visitors.

MANAGEMENT NEEDS

Personnel Needs

Existing staff is minimally sufficient to maintain the handling facility, fence and other structures within the bison enclosure. Current staffing is also minimally sufficient to work animals through the handling facility or to use the baiting technique for gathering animals. The current staff is *not* sufficient or adequately trained to conduct a traditional roundup without assistance from other bison refuges.

Additional staff should include at least 1 bio-tech or range conservationist (GS-0404/5), preferably with knowledgeable of ungulate species. Duties throughout the year would include monitoring the health of bison and elk herds, condition of vegetation, and fence lines. They would repair the handling facility, fences, signs, and keep the cattle guards on the roads clear of snow and other debris and assist with loading animals after auctions. The additional person would also participate in prescribed burns, planting and mowing activities throughout the refuge.

Facility

The current handling facility is more than adequate in size to process as many as 80 animals at a time. However, the facility does not have adequate space to hold large numbers of animals waiting for transport. Safety additions to the facility should be made in the future that include steel paneling on alley ways, more walkways and cross-overs and modifications to the squeeze box. Additional construction should include further re-enforcement of the current east drive fence, a second drive fence on the west end of the facility, and holding pens to retain animals for periods longer than 24 hours. Annual maintenance of the facility includes greasing hinges,

mowing and replacement of ropes and pulleys. The facility should be painted every 3 to 5 years to avoid excessive rust which could pose a health concern for staff in the form of tetanus and weaken the strength of the metal.

Equipment

When baiting is not used to capture the bison, vehicles are used to assist personnel on horse back with herding and pushing animals into the facility. The primary vehicle used for this operation is a heavy duty military surplus Chevy Blazer. Other older trucks in the refuge fleet are also used. Equipment used during the processing of animals include paddles, shock-prods, radios and various veterinary tools.

Literature Cited

HOLECHEK, J.L., R.D. PIEPER AND C.H. HERBEL. 1989. Range Management: Principles and Practices. Prentice Hall, Inc. New Jersey. 501 pp.

Refuge Manager Date

Refuge Supervisor Date

Regional Chief, NWRS Date

Regional Director Date